

## OVERCOMING KEY CONSTRAINTS ON ASSISTIVE TECHNOLOGY UPTAKE IN SLOVENIA

**Abstract.** *This article aims to make a contribution to overcoming key constraints on assistive technology uptake in the domains of social care and healthcare for the elderly. Constraints refer mainly to the lack of strategic planning and cooperation among the groups of key stakeholders and the identification of funding frameworks and business models. The paper delivers a decision support tool, aiding the decision-making process concerning the strategic management of the (wider) exploitation and deployment of telecare services in Slovenia.*

**Keywords:** *assistive technology, aging, telecare, telehealth, cost-benefit analysis, intergenerational cooperation.*

### Introduction

Technological advances, especially those in the scope of information and communication technologies (ICTs), offer great potential for intergenerational cooperation (as well as integration and social participation in the lives of older people). However, many constraints that exclude potential end users from these benefits can be identified (see previous article in this issue). While a number of studies have identified the role of person-centred barriers to older people's learning about and use of ICTs and specifically of assistive technologies (ATs). These barriers include fear and anxiety, lack of confidence, lack of motivation etc.<sup>1</sup> This article investigates the role of key broader structural factors in the adoption of AT in Slovenia. The main purpose of this paper is to suggest how – by considering and manipulating some of these factors – a wider takeup of telecare and telehealth services could be facilitated in Slovenia.

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<sup>1</sup> For a comprehensive review of these barriers, see, e.g., Dolničar (2009a) and Dolničar et al. (forthcoming).

Healthcare services for older people are usually provided in collaboration between hospitals, institutional care and primary healthcare. Introducing ICT support to allow older people to live longer at home will thus have to be linked to changes in work processes and organisational practices for all of these (Vimarlund and Olve, 2005). To achieve the benefits of AT in Slovenia, extensive change is required in terms of a »reengineering« of the mindset and redesign of the nature of work in many organisations.

As discussed in a previous paper (Nagode and Dolničar, this issue), the organised network of telecare (red button) services in Slovenia is facing some obvious weaknesses. The service is only accessible in five regions out of twelve and is not nationally covered. Furthermore, the service is not organized in the public sphere; consequently the state and municipalities are not obliged to participate financially in covering at least some of the costs. That is why municipalities can freely decide whether to contribute to the service to some extent. It follows that the service is not accessible under the same conditions and to the same extent. Another weak point is the fact that the five centers which provide service (red button) are using different technologies that are not compatible with one another. The lack of such organisation results in great expense, because all five centers operate 24 hours a day. One possible solution is the implementation of one nationally organised center. Following some of the studies carried out in Slovenia (Dolničar, 2008; 2009b; 2009c; Nagode, 2003; 2004; 2009; Rudel and Fisk, 2005), we can identify the main factors that hamper wider adoption of ATs in the social care and healthcare domain:

- lack of comprehensive strategic planning, which would be conceived and realised by a central governmental body or agency, the aim of which would be to support local health, housing and social care services in order to promote telecare and telehealth;
- lack of interdisciplinary and inter-departmental cooperation and integration (there should be a better mechanism for co-ordinating activities in telecare and telehealth within and between government directorates, research organisations and the (health)care services);
- lack of business models, funding and reimbursement schemes for AT services;
- lack of understanding of the systemwide distribution of costs and benefits.

The following subchapters discuss these major obstacles to successful uptake of home care technology in the domain of healthcare for the elderly and social care, along with guidelines for policy makers and service providers.

## Central policy framework and comprehensive strategic planning

Current policies for the implementation of (health)care services to older people are too fragmented in Slovenia. While these services are identified by professionals and relevant government departments, a policy on aging, which would coordinate all services to meet these needs, is not deemed to be necessary. It seems that a »first come first served« approach is a common praxis, meaning that service developments are typically a product of ad hoc initiatives from more or less sympathetic directorates (which are increasingly being encouraged to engage in this field by various European Commission guidelines and directives). Thus, it is no surprise that services are not particularly well integrated. Therefore, integration and coordination across and within different ministries, directorates, organisation and sectors is essential. For this purpose, a focal agency could be established, which would have a sufficiently high political profile to be able to effect changes in meeting the major needs of the aging population, i.e. social, health and housing services.

Such a focal agency should provide plans for fiscally sustainable social care and healthcare systems and agendas for public sector bodies »within the best value service framework that seeks not only to ensure continuous improvements in service quality but also to encourage exploration of new patterns of service provision<sup>2</sup>« Fisk (2003: 15). Common assessment frameworks and agreed data sharing protocols should be developed, for example, to avoid duplicated assessments and poor care planning<sup>3</sup>. Besides a coordinating role, this agency should also play an advisory and consultative role, starting with the provision of discussion forums, in which disparate stakeholders concerned with issues relating to older persons would be invited (if not even obliged) to meet and interact.

The agency should also aim to follow some of the general characteristics of high quality comprehensive strategic planning. For example, when planning a telecare service, all partners involved will need to consider how the service will conform to longer-term developments for telecare and telehealth systems. Similarly, local partners (guided by the focal agency) should develop a local telecare strategy, showing how telecare services contribute to other strategies, frameworks and priorities and how services integrate into existing health, housing and social care pathways (Department of Health, 2005: 14). According to the UK's Audit Commission's latest report on

<sup>2</sup> Provision of more qualitative and less pricey services could, according to Fisk (2003: 15), at least in part be achieved by the creation of service frameworks that are more directly accountable to users and/or are delivered, on behalf of local authorities, by private sector agencies or through public-private partnerships.

<sup>3</sup> According to Clark and Porteus (2007: 10), information sharing across agencies with the consent of service users is much more cost-effective than individual services being commissioned in isolation.

tackling the financial challenge of an aging population (2010: 21), the best plans consider impacts across different service areas and are underpinned by: strategic objectives related to an aging population, an understanding of demographic change and realistic forecasts of changes in income and costs. Alaszewski and Cappello (2006) pointed to an important technical issue: if an agency invests in and becomes committed to a particular system and supplier, there may be problems if for any reason they decide to change suppliers, or if clients purchase their own equipment. These may include integration and compatibility problems. There is, therefore, a need to explore potential technologies that are compatible and 'future proof' (Audit Commission, 2004). There is also the danger of the 'hard-sell', manufacturers overselling the benefits of the technology and decision-makers taking an equipment-led rather than person-led approach (Alaszewski and Cappello, 2006: 19), i.e. seeking ways of exploiting the potential of sophisticated equipment rather than considering what equipment is needed to enhance users' quality of life. Fisk (2003), for example, has argued that the equipment should always be deployed in such a way as to empower the end user. Lastly, the agency should assure that the aspirations enshrined in the policies are being met in practice. Of course, there is a clear need for regional and local stakeholders to be involved in the decision-making process, but this process should be coordinated by a more centralised body.

Good examples of a focal agency illustrated above are the UK's Audit Commission, the Care Services Improvement Partnership (CSIP) in the Department of Health and the CSIP Housing Learning and Improvement Network, all of which have published (online) detailed guides to and tools for developing and delivering telecare and telehealth services. Different types of learning and improvement tools include showcases about what telecare can achieve, value for money modelling tools, strategic business case models for local telecare projects etc<sup>4</sup>. A centralised governmental agency, which would plan, support and coordinate the promotion and deployment of telecare and telehealth services, could also tackle all the issues that are discussed in the remainder of the paper.

### **Interdisciplinary, inter-sectoral and intergenerational cooperation**

Although there are not many electronic services for older people available in Slovenia, there is considerable fragmentation in terms of the services offered and the stakeholders involved. This may be attributed to several

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<sup>4</sup> For a very detailed study and notes of guidance, with accompanying files for calculating costs, see [http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/documents/digitalasset/dh\\_4115665.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4115665.pdf).

facts. There seems to be a historical legacy of noncooperation between policy makers from different ministries and directorates in Slovenia. Thus, service policies are often made within the confines and expertise of particular directorates, which are conceptually and operationally isolated from other directorates. Fragmentation is also evident on a local level. As Rudel and Fisk (2005) ascertained, the reorganisation of municipalities into tiny local communities has almost precluded regional initiatives in Slovenia<sup>5</sup>. Lack of cooperation and interaction is also evident among developers, scholars, practitioners and even between the (usually older) users and the (usually younger) informal carers, which raises serious problems concerning policy-making and resource use in health-care systems in practice.

However, the challenge of an aging population is a challenge for stakeholders in social care, health care and housing, all of whom contribute to the wellbeing of the aging population. This is a whole-system issue that goes beyond the boundaries of any one ministry, directorate, department or organisation. Telecare embraces a number of policy areas, including fair access to care services, personal support, community safety, social exclusion, intergenerational cooperation and management of long-term conditions. Home care technology solutions should not be arrived at within a vacuum, and the importance of multiple stakeholder collaboration to help identify issues and work towards appropriate technology solutions should be explored. As mentioned by McGee-Lennon and Clark (2007: 8), »knowledge and requirements must be shared and understood and potential conflicts negotiated and resolved before technology can be identified, prescribed, installed and ultimately used successfully«. Furthermore, a workshop on the topic of telecare implementation, where participants from various stakeholder groups participated, clearly showed that, »if we try to meet all the requirements for only one stakeholder then this may make a solution obsolete for another. Therefore, all the stakeholders must be at least minimally satisfied with a policy or project, or it will fail« (McGee-Lennon and Clark, 2007: 10).

By stakeholders, we mean all those who consider themselves to be involved or interested in ATs. The stakeholders that play the most important roles (and have different needs and motives) are as follows: primary end users, formal and informal carers, social care providers, health care

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<sup>5</sup> Chan and Phillips (2002) stated that it is unlikely that problems resulting from the lack of coordination at a local level can be tackled solely by central aging policy. What is also required is for service departments to be accountable at local district levels, where services are delivered and received. While the government has a role in »setting a coherent framework across the sectors responsible for care provision and creating an environment that encourages interdepartmental and interagency coordination for the delivery of telecare« (Tang, Gann and Curry, 2000 in Alaszewski and Cappello, 2006), this framework conditions need to be utilised by local stakeholders.

providers, technology providers, housing providers, researchers and policy/decision makers regarding the use of ATs.

Care delivery thus involves a multiplicity of stakeholders from different organisations. Working in multidisciplinary teams is fundamental for the development of ATs. Researchers and developers increasingly recognise the need to cross the barriers of disciplines to create products that match the future demands of users. A more multidisciplinary approach to the development process opens the way to new possibilities, perspectives and methods. However, the expertise differs across professionals' profiles and backgrounds, a situation which can pose challenges to the design and implementation process for ATs. The available knowledge of gerontologists, for example, is not always in a format that is immediately understood and applicable by the industry, so this knowledge has to be transformed into a usable form. As Bouma (1992: 5) explains, for this to be accomplished, close ties are of paramount importance. He then concludes that we must work together in order to understand where problems exist for designers and product managers. The difficult is that this is an interdisciplinary venture. Designers and engineers are unused to dealing with such data; it must therefore be transformed and distributed in a form that is meaningful to them. Furthermore, different professionals not only perform a variety of roles and have different knowledge backgrounds, but the cultures within which they operate mean that there is a need to accommodate differing perceptions of risk and different value systems. For example, those held by care professionals with a medical and those with a social care background are rather different. This tends to manifest itself in perceptions of hospital and other institutional settings as environments where patients can be »looked after«, rather than a social care perspective which emphasises rehabilitation, »re-enablement« and the promotion of independence (Audit Commission, 2004). Another example of differences between the given stakeholders involves the different mindsets among potential end users of the ATs (i.e., older people and carers) and the social scientists conducting research aiming to assess the needs of end users. This example comes from the SOPRANO 6th Framework Programme project<sup>6</sup>. Within this project a user-oriented research approach was applied through needs assessment and requirements analysis, focusing on users through innovative participatory methods. When involving users in identifying and developing ideas with a high potential for technological innovation, these ideas should be closely tied to the experiences and mental models of the users. It was therefore necessary to find a way to elicit real user needs. This was done by

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<sup>6</sup> SOPRANO stands for Service Oriented PRogrammable smArt enviroNments for Older Europeans (<http://www.soprano-ip.org/>).

applying the Guardian Angel metaphor, a methodological tool which is to be understood as a personification of the ATs aimed at easing developing ideas. The idea was introduced in order to help participants overcome a technology-centred way of thinking. The identification of user needs and user requirements as well as the generation of design ideas should not be biased by explicit assumptions about or knowledge of what might be possible with today's technology. Therefore, the Guardian Angel metaphor helped to overcome these limitations, because an angel is not limited by any constraints. The use of the metaphor also helps to overcome scepticism or even fear of computer technology, a tendency often found among older people. The theatre method was also applied for similar reasons (for an in-depth discussion about this see e.g. Dolničar et al., forthcoming).

Besides the abovementioned approach, there are many ways through which different stakeholders could be working towards increased mutual integration (be it professionals from health and social care systems, researchers from the social sciences and natural sciences and engineering, or the older end users and younger formal or informal carers). A particularly relevant example comes from the UK's Improvement Network, which hosts a self-assessment tool to help local public services improve joint working<sup>7</sup>. Similarly, the Audit Commission has developed a delivery chain analysis tool to help councils and their partners overcome obstacles to joint working (Audit Commission, 2009a). Also from the UK, a large-scale government funded programme commencing in mid 2007, »Whole system long term conditions (LTC) demonstrators«,<sup>8</sup> showed that people with more complex needs can be efficiently supported by ATs that provide a mix of telecare and telehealth services.

What seems to be an excellent way of establishing more holistic interdepartmental, interdisciplinary and intergenerational cooperation is a workshop, which could be an opportunity to bring together stakeholders associated with home care to jointly focus on how AT could support health and social care delivery at home. It could provide insight into alternative views and practices that could enhance the experience of designing, implementing, or using the red button social alarm, as well as more enhanced AT. The event could include several sessions of presentations from experts in each of the stakeholder groups identified above. The workshop could then conclude with a moderated interactive session on the lessons learned within and between the stakeholder groups. The aim of this workshop would be to gain a rich, representative overview of the constraints on and facilitators

<sup>7</sup> This tool can be accessed at <http://www.improvementnetwork.gov.uk/imp/core/page.do?pageId=1068192>.

<sup>8</sup> Information about the programme and its demonstrators is available at <http://www.integratedcarenetwork.gov.uk/icn/index.cfm?pid=105&catalogueContentID=850>.



of successful planning, design and uptake of ATs. Such an event could provide an opportunity for awareness raising between participants within the groups and for exploration of potential conflicts and for reaching negotiated solutions. For example, a solution that would benefit one stakeholder group may negatively impact upon other stakeholder group(s).

Among the important ways to facilitate intergenerational cooperation is to improve computer literacy among older persons; cooperation between younger and older people is usually fostered through the process of learning (the younger usually instruct the older), as well as through a possible increase in the social inclusion of the older people (mostly by way of using some of the interactive types of electronic services).

While a body of knowledge exists in the sphere of technology and gerontology to intervene technologically in home care, it appears that an integration of efforts is lacking. As Bouma (1992: 11) stated, »such integration must necessarily encompass research (in many disciplines), development, design and marketing, as well as the integration of political, economic and business objectives«. The next two sections cover the latter two objectives.

### Funding frameworks

In parallel with the consideration of policy and coordination, funding is the crucial issue in social and health care. Today and in the future, increasing resources are likely to be required in the light of the demographically aging population and the increasing costs of providing health and social care services. This should prompt the government to look for »better ways of serving the elderly population (among others) and boosting and conserving revenue« (Chan and Phillips, 2002). Although initial capital investments are required with any new care network, the resulting service would be expected to yield considerable savings on national institutional care costs (Rudel and Fisk, 2005; Alaszewski and Cappello, 2006). It is therefore important to develop clearly defined business models<sup>9</sup>, which would unequivocally state the potential investors, providers and consumers (who are not necessarily the end users, but insurers as well). On the basis of a detailed business model, return on investment should be calculated as well, so investors could make informed financial decisions.

As already mentioned, designing a telecare service involves the engagement of several stakeholders. Consequently a number of funding frameworks or business models are possible. On the most general level, the Audit Commission (2004) identified three broad service model types:

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<sup>9</sup> The term »business model« is used deliberately, as there are important issues of payment and reimbursement that must be addressed at the planning stage.



- one where the service is wholly within the statutory services, such as health, social care and housing;
- where there is a partnership between the public and private sectors; and
- where the service is provided by the private sector.

In each model the stakeholders have different roles and responsibilities.

In most European countries, the government has a clear responsibility for providing home care services to at least some degree, either directly or by granting allowances that people can use to purchase them. In some countries (e.g., Denmark, Norway, Iceland and Sweden) it seems that the government is legally obliged to provide such services for older people if needed, although in some this is only if a person's needs cannot be met in another way. The services are mainly funded through general taxation.

In some countries, there is no legal obligation to provide home care services, but there is a more general, less precise commitment on the part of the state to provide the necessary services to enable older people to remain in their homes for as long as possible or to provide support for the elderly and the disabled. In other countries, the government provides some home care services but priority is given to older people on low incomes, living alone. The provision of home care services falls into the category of social assistance and is usually linked to poverty, age or social isolation.

The business model finally adopted depends on the local conditions and care priorities to be addressed. Some European countries (e.g., Luxembourg, Germany, Austria and Belgium) have obligatory long-term care insurance that covers home care. The actual level of care provided is dependent on the assessed level of need and is subject to the fulfillment of certain conditions. In these countries, the insurance organisations have a key role to play in setting the market framework.

Additionally, in the vast majority of European countries, voluntary organisations, NGOs and religious organisations play a role in providing home care services. Often, these organisations are completely independent, but in some countries, their services are organised and coordinated in collaboration with the state.

Finally, there is a growing private social care provision sector in some countries. The US is a clear case in point, fuelled in part by private health and long-term care insurance. European countries such as Ireland also have growing private care provision (Fisk, 2003: 16), fuelled by increasing private demand driven by lack of availability and restrictive eligibility criteria for access to public services, as well as tax relief to families to offset the cost of private care purchase. In addition, the trend towards provision of direct payments to older people is driving an increased market for private social care services.

In Slovenia, policy-making in welfare and health, in general, is government-led. Private sector hospital capacity, for example, is very limited. The cost for the provision of long-term care (including formal institutional care and community services) for older persons is borne mainly by the government from general revenue. Service users contribute only a relatively small portion of the full costs of care. There are currently few or no private health insurance schemes available for long-term care for older persons. In such a situation, Rudel and Fisk (2005) claim that the government should cover 30% of the response centre infrastructure costs. Local funds are required for the purchase of devices such as carephones, for workforce costs and the response centre facilities. It is expected that end-users would accept AT if it was paid for by social and health insurance; health insurance agencies have included the service in their optional insurance schemes, and private companies are willing to offer technical support. Another constraint on the uptake of ATs in Slovenia is unequal pricing across the country. Currently, for the red button social alarm, the level of payment for the service depends on several factors. Since there are five different providers (centers) using different technologies, they charge different prices for the phone and technology. Municipalities are not obliged to contribute to the total price, and for this reason each municipality contributes a different share of the total price. To deal with the challenges ahead, the Slovenian government should probably consider new sources and methods of financing long-term care<sup>10</sup>. It seems that the best mode would be the one that Chan and Phillips (2002) described as a »mixed economy of provision«, according to which services for older persons are delivered by a mixture of public, private and voluntary providers, with increased charges for selected items or selected user groups.

In this respect, reforms in funding sources and structure and initiatives to promote a continuum of care and enhanced home care should be proposed. For example, in the UK (and also many other European countries, where mixed economies are increasingly the norm in healthcare systems), various levels of co-payment for some or all aspects of telecare services are required. Also, different levels of equipment and service may be financed in different ways, depending on assessed levels of need, income and other factors.

Along these lines, an important issue to consider is insurance-based reimbursement. Although most social and medical care has traditionally tended to be provided as a public service in Slovenia, a growing trend

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<sup>10</sup> Long – term care in Slovenia is not yet organised as a separate system within the system of social security and does not have special insurance for LTC. As already mentioned in a previous paper (Nagode and Dolničar, this issue), the Act on Long-term Care and Insurance for Long-term Care is still in preparation and reconciliation. Even though it has passed public debate, the fate of the act is not yet known.

towards the introduction of long-term care insurance is evident in Europe and worldwide. In insurance-based systems the issue of reimbursement arises in various ways. While some systems work by way of re-imbusement of out-of-pocket expenditure incurred by the insured party, other systems work through reimbursement of the provider for provision of any of an agreed set of services. In any case, health insurance systems may include some element of social care as part of the package under certain circumstances. One could expect that, if the insurance organisations (as the potential payers) clearly recognised the incentives, effectiveness and the cost reductions, funding through the medical insurance system would increase – which is the main facilitating factor for mainstreaming this service (Dolničar, 2009b; 2009c). One possibility for wider implementation of the social and medical care services would be to »convince« insurance companies to integrate these services and applications into their programme. Sound business models should thus be developed and presented to the insurers. There are still many unanswered questions, for example, regarding the supply and ownership of telecare equipment. The Department of Health (2005) has identified four different possibilities: direct purchase and ownership, leasing, rent/managed service and self purchase.

In public-provision based systems, another important consideration related to different modes of funding for telecare and telehealth services concerns the eligibility rules. In line with the current healthcare system in Slovenia, eligibility based on assessed types or levels of need in combination with financial criteria (with eligibility confined to those on low incomes) seems most adequate. In the report by the Audit Commission (2004) it is stressed that the creation of referral protocols and staff training to identify users who could benefit is also an important part of a telecare service that should be anticipated. According to Brownsell et al. (2006) policy makers should also explore current differences between health and social care partnerships in the ways in which they determine client eligibility for packages of care supported by AT and, as a result, whether there is a need to develop a standardised national approach for determining eligibility.

The government therefore needs to give clear policy statements to show its active pursuit of better service provision for older persons, to enable them to continue living in their own communities. However, the government needs to do more than just try to encourage such provisions; it needs to commit resources to them<sup>11</sup>. In addition, whilst the family is depicted

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<sup>11</sup> *In its desire to promote individual independence among older people, the UK government, for example, has committed a high level of funding to the provision of AT. A total of £80 million was allocated to local authorities and their partner organisations between 2006 and 2008, using the Preventative Technology Grant, and a further £80 million was planned between 2008 and 2010 under the banner of Extracare*

as the key source of care for older persons in community care, there is little evidence of concrete services to support this type of intergenerational cooperation in fulfilling such functions. Governments and institutions should give more financial resources for various projects that encourage intergenerational dialogue. In addition, more aid should be given to the non-governmental organisations that are contributing greatly to the realisation of intergenerational solidarity with the help of volunteers.

Each funding framework (and all corresponding financial models) has its advantages and disadvantages in terms of risk and rate of return on investment. However, the current lack of system-wide evidence may inhibit the takeup of ATs, since »service providers cannot make accurate pricing decisions« (Audit Commission, 2004: 20), and mechanisms for reimbursement or payment for services cannot be established. Implementation of AT will thus need to be based on a better understanding of the distribution of costs and benefits.

### Understanding costs

Decisions about the development and implementation of AT need to be made on the basis of a clear understanding of the costs and benefits. In some respects, the cost savings attached to using AT are obvious. Bowes and McLogan (2006: 132) give two examples of cost savings: if someone falls and assistance comes quickly, a long hospital stay may be averted. Or if there is a small fire, quickly extinguished, personal injury and damage to property are significantly reduced, as compared with a large one. However, calculating costs and benefits in monetary terms is difficult<sup>12</sup>. Several researchers (e.g., Alaszewski and Cappello, 2006: 22 and 29; Audit Commission, 2009b; Clark and Porteous, 2007: 11; McGee-Lennon and Clark, 2007: 11; Poole, 2006 in Bowes and McLogan, 2006: 16–17) acknowledged that there was a lack of rigorous data on the cost implications of AT, owing to the nature of the current evidence based on small-scale pilots and evaluations, and even fewer attempts at modelling the potential cost effectiveness

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*Housing (Department of Health, 2008). In return for this investment, the government anticipates potential benefits for people who use services in addition to a redistribution of health and social care spending. It was estimated (Department of Health, 2005: 8) that an additional 160,000 older people would get support to live at home with safety and security and that this would reduce the number of avoidable admissions to residential/nursing care and hospital. The Slovenian government should also consider a »financial injection« for the start-up of the mainstreaming process of even the most basic social alarms, not to mention the takeup of more advanced ATs.*

<sup>12</sup> This is particularly true in the case of preventative (rather than reactive) care. Effective prevention focuses on improving quality of life, resulting in delay or prevention of the need for social care. There is a clear financial case for fall prevention work (Audit Commission, 2009b: 9), but for other types of prevention, the argument is that prevention ought to lead to savings – but there is little evidence of this.

of the introduction of telecare on a larger scale. The other difficulty with estimating costs and benefits is related to the complex nature of integrated care provision. McGee-Lennon and Clark (2007: 11) explain that telecare is typically seen as a social care (community alarm) technology and yet one of its greatest potentials lies in a preventative role to detect, for example, changes in behaviour that may be indicative of a change in wellbeing. In this role the benefits stack up heavily in favour of health care services with little additional benefit to social care. Telecare should therefore be seen as both a social care and a health care service that requires integrated working and budgets. The Audit Commission (2004: 23) gives an eloquent example of apportioning the costs of telecare and of unequally distributed benefits: paying a call-centre to provide a monitoring and response service to support a patient with a chronic disease may keep the patient out of hospital for longer and reduce any period of hospitalisation. Superficially this is a benefit to the healthcare provider. However, the support provided by the telecare service may increase the patient's confidence and that of their family carers, so that they do not have to transfer to sheltered accommodation with a care package or to institutional care. The result is a benefit to social services. Alaszewski and Cappello (2006: 22) give a contrary example of the incentives: if there are financial benefits, such as reduced hospital admissions, these benefits may accrue not to the social care agency that is funding the telecare scheme but to the health care agency providing acute hospital care.

Even though the full potential of advanced telecare and telehealth is still to be firmly established, much progress has been made. Let us illustrate this with some examples. In his overview of the earliest studies on cost savings, Fisk (2003) mentions the study by Sherwood and Morris (1981), which was, in his opinion, the most important because it signalled findings that were to be repeatedly endorsed in the outcomes of further work. This study resulted in cost savings for at least some types of users, through the »reduced use of institutional and community based resources« (Sherwood and Morris, 1981 in Fisk, 2003: 241). These findings led to subsequent studies in both the United States and Canada that pointed to cost savings through decreased levels of hospital admissions and in-patient days (Cain, 1987; Roush et al., 1995 in Fisk, 2003: 241) and reductions in home support (Dixon, 1987; Chumbler et al., 1998 in Fisk, 2003: 241). Outside North America, only three studies have looked at the potential for cost savings (Tamborini et al., 1996; Brownsell et al., 1999; Farquhar et al., 1992 in Fisk, 2003: 241), all of which indicated that the use of social alarms enabled cost savings to be made through a reduced need for residential care. Turning to more recent studies on the benefits of AT, we find that they do back up the hypothesis that access to these technologies can reduce an older person's

use of beds for acute and long-term care (Rice, 2005; Preece, 2005). One American study (with the participation of 2368 individuals) indicated that access to AT can reduce an older person's need for personal assistance at home (Hoenig et al., 2003; Brownsell et al., 2006). In Europe, the UK seems to be the leading country in terms of conducting projects and studies of this kind; three demonstrator sites have recently been launched in Cornwall, Kent and Newham with government funding, to test the cost-effectiveness of advanced telecare and telehealth on up to 7500 recruits (Clark and Porteus, 2007: 11) – results have yet to be published. Also in the UK, an extensive research and evaluation study of smart technology in West Lothian (Bowes and McLogan, 2006) demonstrated that, owing to the new model of care, the incorporation of AT in »West Lothian was performing particularly well in costs terms as compared with other local authorities in Scotland, and demonstrably using its rather limited resources very effectively« (Bowes and McLogan, 2006: 132). The authors of the study also reported that both care at home services and the new housing with care developments were producing significant savings as compared with care homes, whilst also being popular with the clients who used them. Similarly, the Wanless research team (Audit Commission, 2009b: 9) argued that »spending on [community care] services 'buys' additional days for people in the community before an institutional care solution becomes the only choice for them«. Their analysis of social care savings made by local authorities also led them to say that »with a given budget and controlling for need, local authorities can substitute residential places with intensive home care packages at the same cost or slightly less« (Audit Commission, 2009b: 9).

A thorough literature review also resulted in some concrete numbers in terms of cost savings. The final business case and LinkAge Plus end-of-project report give cost cases for different approaches; the most solid case is for fall prevention. On average, in the five years following the first pilot investment, the LinkAge Plus pilots have saved £1.80 for every pound invested (Department of Work and Pensions, 2009 in Audit Commission, 2009b: 2). A case study on savings through telecare in North Yorkshire showed that this site is saving £1 million a year by using telecare in place of traditional care packages<sup>13</sup> (Audit Commission, 2010: 43). Another example comes from the Essex County Council Telecare scheme. Currently the average first year telecare package cost in Essex is £317. The average cost of residential accommodation in Essex is £400 per week. If only 2 per cent of those using telecare are enabled to remain in their own homes, this

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<sup>13</sup> In addition, it is worthwhile to mention that users rated telecare highly: 91 per cent rated it excellent or very good. Following this study, the council set a target of including telecare in 15 per cent of service packages.

amounts to a saving of approximately £2 million in one year. Furthermore, the use of telecare medication dispensers in place of two 15-minute home care visits a day can save over £4000 per person per year. An early evaluation of telecare intervention in Essex showed a saving of £3.80 per pound spent across a small sample population, arising from reduced care hours and from prevention of transfer to residential or care homes (Audit Commission, 2010: 44). The most recent UK Audit Commission report (2010) on AT also states that the cost of introducing telecare in the pilots compares well with traditional care packages. An average telecare package pays for itself in just under six months compared with the alternatives. The Department of Health (also in the UK) has run pilot projects with evaluation focuses on savings to the National Health Service (bed days) but not on social care or other council services (Audit Commission, 2009b: 3). Evaluation of these pilots found that »for every £1 spent on POPPs [Partnerships for Older People Projects programme], an average of £0.73 will be saved on the per-month cost of emergency hospital bed days« (PSSRU, 2008 in Audit Commission, 2009b: 3). More housing-oriented research also suggests that AT produces savings – according to Lansley et al. (2004) up to one-third of costs. The Audit Commission (2008) also gives examples of home adaptations and improvements as a cost-effective way to improve housing for older people.

### Conducting cost-benefit analysis

As stated in HM Treasury's Green Book (2003), the preferred economic approach for estimating costs and benefits seems to be cost-benefit analysis. This method focuses on measuring net economic gains, the difference between the economic value of direct benefits (as far as quantitatively possible) minus the identified costs. It can be used for both ex post evaluation and ex ante assessment based on past experience and expert forecasts of future values (HM Treasury, 2003). The results of this analysis usually feed into the business plan and exploitation schemes.

Let us present a conceptual and methodological framework for estimating costs and benefits in the process of implementing telecare services, which could (or should) be used by the interested stakeholders in Slovenia when the process of mainstreaming the red button social alarm and/or the implementation of more advanced ATs will start (the main body of the framework presented in the following is adopted – as well as adapted for the Slovenian context – from SOPRANO (2008).

The overall aim of cost-benefit analysis is to estimate and compare both the known and expected costs of the implementation of AT as well as its tangible and intangible benefits. To this end, data derived from various sources



have to be collated and analysed. Wherever possible, the analysis uses quantitative data and produces quantitative outputs, i.e. time spans, costs, quantitative survey outcomes etc. For the more intangible benefits related to the quality of life of older people and their family members, the focus will necessarily be more on qualitative outputs, since many of the concepts analysed here (such as a person's feeling of security or independence) can only partially be grasped through quantitative measures. However, to allow for an economic assessment, benefits are assigned a quantitative value wherever possible. Where estimates are required, these are based on conservative assumptions. All monetary values are converted into comparable measures by presenting them in present values.

To guide data collection and analysis, a typology of costs and benefits has to be developed. For this purpose, a set of indicators are derived, which are then used to measure the corresponding cost/benefit items in order to produce the raw data for eventual analysis.

Two groups of actors have to be queried when collecting the data:

- The users of the AT involved in the project, i.e. older people, their family members, and professional carers. This concerns data on the different types of benefits and, to a lesser degree, on operational and investment costs.
- The developers of AT, i.e. the partners in the project consortium. On the one hand, this concerns data on the costs and eventual market price for the assistive system and its components, as well as on costs for installation, support and maintenance to be received from the technological partners. On the other hand this includes data on stakeholder training and process adaptation to be collected from professionals with expertise in user research and active care work.

The data gathered in this way is then used for a cost/benefit analysis, i.e. a direct comparison of costs and benefits both from a partial perspective for the different stakeholders involved, and on the overall level for the assistive system as a whole. Stakeholders to be considered in the cost-benefit analysis should include at least the following: older people and informal carers, on the user side, and care service providers, IT service providers and reimbursers, on the provider side.

Benefits are identified from the perspective of each stakeholder group involved. They cover three main categories: quality of care, economic efficiency and (in a more qualitative manner) quality of life (i.e., in relation to older people). Each category can be further divided into several sub-categories:

- quality of care: increased service range, improved service effectiveness - reduction of errors, avoidance of unnecessary measures,

- economic efficiency: efficiency of care – time and treatment savings, efficiency of administration – improved information gathering, improved information processing, improved control;
- quality of life: new and/or improved services and feelings of security, independence and social participation.

Costs are divided into two main categories: investment costs and the costs of running the service. Investment includes initial costs for ICT hardware and software (including installation), costs for training of the stakeholders involved and costs of process and organisational change. Operational costs include costs for the maintenance and replacement of IT components, user support, running the AT, deploying and marketing, as well as costs related to the various care processes involved. Costs can also be divided into the direct and indirect costs associated with a reactive-mode telecare service, and the additional indirect costs of preventative-mode telecare. The not inconsiderable initial costs associated with the planning stage before a decision has been made to implement a telecare service should also be considered. Indirect costs associated with review procedures will also occur throughout the lifetime of the service (Audit Commission, 2004: 23). Bowes and McLogan (2006) introduced yet another important conceptual issue in interpreting costs data. This is whether to focus on per period or per client costs. Per period costs capture how much care is provided by social work departments in each period. Per client costs try to capture the total cost of supplying care to a client. This cost is calculated over the entire period during which the client receives care and may include spells of hospitalisation.

The main technical tool in the methodology can be a spreadsheet data collection and analysis model. The already developed cost-benefit modelling approaches may provide a useful starting point for conducting cost-benefit analysis. The Telecare Learning & Improvement Network in the UK has developed a business case modelling tool to support social service departments in the development of strategy and business cases for local telecare projects<sup>14</sup>. The tool helps to predict human resource and other implications of telecare implementation, such as productivity gains and staffing levels.

Apart from more direct impacts in terms of costs and benefits that can be directly related to the uptake of AT, wider impacts on various parts of society should also be analysed (these are usually evaluated by expert assessments and by satisfaction surveys among users of telecare and their carers).

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<sup>14</sup> This modelling tool is available online at [http://www.integratedcarenetwork.gov.uk/\\_library/Resources/Telecare/Telecare\\_advice/Strategic\\_Business\\_Case\\_Model\\_-\\_Balance\\_of\\_Care.xls](http://www.integratedcarenetwork.gov.uk/_library/Resources/Telecare/Telecare_advice/Strategic_Business_Case_Model_-_Balance_of_Care.xls).

One important aspect of estimating the wider impact of AT is the effect of introducing these technologies into the homes of older people on intergenerational cooperation (which could be enhanced; for some examples of this, see Dolničar, 2009a). All the outcomes should then be disseminated to various groups of stakeholders in order to allow for informed decision making, the formulation of policy and business strategies or the self-guided analysis of wider impacts, e.g. on the social care system.

To conclude, the discussion on the costs related to introducing AT indicates that »there is enough evidence to suggest that telecare services should shift into the mainstream« (Alaszewski and Cappello, 2006: 29), despite some difficulty in predicting the impact on direct and indirect costs and benefits.

## Conclusion

Demographic changes together with the need of old people to live (independently) at home for as long as as possible are pressuring Slovenian politicians and experts to mainstream social alarms and to develop new or adopt existing telecare services for older people. New technologies are continuously evolving, with the potential to increase the quality of living, comfort, safety, welfare and interpersonal relationships, as well as intergenerational cooperation. Assistive systems are certainly valuable tools for supporting and enabling older people to enjoy (more) independent living in their home environments. ATs have also been found to benefit the family members, friends and other caregivers who interact closely with older people in their everyday lives.

The successful uptake of home care technology depends on a number of factors. In Slovenia, the most important barriers to the implementation of these technologies seem to be related to the contextual policy background and health care system and include the lack of strategic planning and cooperation among the groups of key stakeholders and identification of funding frameworks and business models. This paper has described various recommendations that should be considered within future policy-making, research and development efforts, aimed at mainstreaming the basic social alarm system and introducing telecare and telehealth services in Slovenia. Policy makers will have to take practical steps to embed telecare and telehealth within mainstream services. These steps include routine activities such as needs assessments studies, consultation with different stakeholders, setting specifications, and monitoring outcomes. Policy makers will also have to resolve initial implementation barriers such as funding, cost recovery, training, and implementation details. In particular, policy should focus on providing the means to overcome the initial financial risk taken by investors when trying to market AT for elderly home care.

Evaluative studies will also need to be undertaken to generate knowledge about the impact of AT on users and carers. If these technological developments are harnessed in appropriate ways, this could facilitate intergenerational cooperation and the engagement of older people. As stated by Fisk (2003: 246), »the usage of technologies in inappropriate ways would represent a failure to grasp the opportunities available, and would serve to exacerbate social exclusion and the marginal position of many older people«.

The key challenge for telecare and telehealth services in Slovenia is now to move from the current pilot phase into a mainstream service in order to support the well-being of an increasingly large number of older people and their family members. This will need to be supported by the sort of effective planning described in the paper, where it will be crucial to success to foster partnership and integrated working across the fields of housing, health, community safety and social care. Thus, there is a pressing need for better co-ordination of telecare implementation in Slovenia at both national and local levels and for more integrated guidance to support local implementation. Different business models have to be envisaged, depending on the local conditions and needs assessment.

We should point out that a number of other factors should also be considered as barriers (or facilitators) to development and takeup of ATs in Slovenia; some of the most important are the following:

- awareness raising on availability and on potential benefits of ATs, targeted at families and healthcare professionals (who should also be involved in practical guidance on usage);
- mechanisms for improving learning across different telecare and telehealth projects (many projects are developed in isolation and without an awareness of the existing knowledge base across the European countries; therefore, mechanisms to foster learning internationally, within and across the health, social and housing services, should be introduced);
- service integration (the need for interoperability between the different home care devices and services, as well as for having a clear vision about how technology can support existing and future services);
- implementation issues. i.e. clear operational or policy implementation plans for service delivery;
- understanding older people's needs, fears and aspirations (which should be achieved by the user-centred research approach when developing ATs).

While a number of specific issues remain to be dealt with, we nevertheless hope that this discussion makes a useful contribution to the necessary debate in Slovenia.

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